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[PDF] Kumaran- a multiprocessor system for swept sine vibration control ...
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The signal from the power amplifier is used to. vibrate ... frequency but the
frequency cell number. Whereas. the sweep frequency ranges from ...
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[PDF] Design and validation of a test fixture to model hand arm ...
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The vibration exposure will. model the power tools and the. cell. culture will model
human ... The sweep generator sends a signal to the comparator, which ...
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This device can be used as a sweep unit or body worn counter surveillance ... 3 LED
indicators to determine signal strength, Audible alarm, vibration alarm, ...
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Manipulation and controlled amplification of Brownian motion of ...
By this technique, the amplitude of cantilever vibration and the quality ... an external
frequency sweep generator since the vertical difference signal due ...
link.aip.org/link/?APL/78/1637/1 - Similar pages

[PDF] A SELF-LOCKING TECHNIQUE WITH FAST RESPONSE AND HIGH SENSITIVITY ...
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frequency sweep signal as it locks to the fundamental resonant frequency of the
vibrating. cantilever. The sensitivity required to track a small shift in ...
www.mrs.org/s_mrs/bin.asp?CID=2540&DID=108784&DOC=FILE.PDF -
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Converted signals (velocity and buffered acceleration) are easily used by vibration
testing systems including the PBS-4100 family of engine vibration ...
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Electrical/mechanical/sound converter and apparatus of electrical ...
Moreover, functions to generate the sweep signal and resonance frequency signal
at least for vibration may be provided to the oscillator (a function for ...
www.patentstorm.us/patents/6373958-description.html - 46k -
Cached - Similar pages

The International Spy Shop
After a sweep, the alarm monitor guards against new devices brought in, ... to shun
away cellular or RF disturbance. Find best signal spot for wireless CCTV ...
www.issexperts.com/countersurveillance.html - 60k - Cached - Similar pages

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Web

Results **1 - 10** of about **994,000** for <u>wireless</u> and <u>resonant frequency</u>. (0.12 seconds)

Howstuffworks "How **Wireless** Power Works"
Introduction to How **Wireless** Power Works. 2. **Resonance** and **Wireless** Power ...
It's easy to get objects to vibrate at their **resonant frequency** and difficult ...
electronics.howstuffworks.com/**wireless**-power1.htm - 39k - Cached - Similar pages

[PDF] **Wireless** Magnetoelastic **Resonance** Sensors: A Critical Review
File Format: PDF/Adobe Acrobat - View as HTML
detected **resonant frequency** of a magnetoelastic sensor shifts in ... Keywords:
Magnetoelastic, Sensor, **Wireless**, Passive, Remote query, Micro-sensor ...
www.sentechbiomed.com/publications/MEsensors.pdf - Similar pages

[PDF] Dual **resonant** slot antennas for **wireless** applications - Antennas ...
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miniaturization of personal **wireless** communication (PWC) devices becomes a ...
resonant frequency of the slot. The width of the microstrip feed and the ...
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The **resonant frequency** of a dielectric resonator can. be calculated by its
dimensions, permittivity, ... **resonant frequency** variations ais H , changes. When ...
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A **wireless**, passive, remote query sensor platform is presented capable of ... The
resonant frequency of the sensor is detected remotely with one or a pair ...
www.ingentaconnect.com/content/els/09244247/2001/00000093/00000001/art00624
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IngentaConnect **Wireless**, passive, **resonant**-circuit, inductively ...
This paper presents a non-contact, **wireless**, passive, ... strain with shifted **resonant**
frequency independent of whether the sensor was embedded or not. ...
www.ingentaconnect.com/content/els/09244247/2002/00000102/00000001/art00342
- Similar pages

[PS] APPLICATION OF SMART MATERIALS TO **WIRELESS** ID TAGS AND REMOTE ...
File Format: Adobe PostScript - View as Text
Resonant Frequency. (MHz). Figure 5. Data for **wireless** force sensor incorporating
a piezoelectric polymer dielectric. The upper curve is the response of an ...
www.media.mit.edu/physics/publications/papers/tags-mrs.ps - Similar pages

[PDF] MICROFABRICATED, **WIRELESS**, MAGNETOELASTIC MICRO-PARTICLES FOR THE ...
File Format: PDF/Adobe Acrobat
that the signal transmission is totally **wireless**, allowing use of these sensors ...
reflected impedance mode is used for sensing the **resonant frequency**. ...
www.mrs.org/s_mrs/bin.asp?CID=8683&DID=194773&DOC=FILE.PDF -
Similar pages

[Paper] CPW-Fed C-Shaped Printed Planar Antenna for Dual Band ...
However, in this design, the **resonant** mode at **frequency** 2.6GHz is not strong and
hence may be not suitable for **wireless** communication applications. ...
www.actapress.com/PDFViewer.aspx?paperId=21066 - Similar pages

[Paper] Advanced System-On-Package (SOP) Multilayer Architectures ...
The effective length (L) and width (W) of the cavity, using TE101, can be decided by
the **resonant frequency** equation of the rectangular waveguide cavity [4] ...

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wireless and resonant frequency and speaker | Search | Advanced Search
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Web   Results **1 - 10** of about **114,000** for <u>wireless</u> and <u>resonant</u> <u>frequency</u> and <u>speaker</u> <u>vibrate</u>. (0.25 seconds)

<u>Built-in micro-**speaker** for **wireless** communication device - Patent ...</u>
The built-in micro-**speaker** of claim 8, the number of the holes on the **resonance**
mask depending on a desired **resonance frequency**. ...
www.freepatentsonline.com/20020127976.html - 34k - <u>Cached</u> - <u>Similar pages</u>

<u>freepatentsonline.com: Electrical audio signal processing systems ...</u>
Resonant frequency adjustment using tunable damping rods ... The tuning may
tuned the mechanical device to reach that **vibration**. ...
www.freepatentsonline.com/rssfeed/rsspat381.xml - 16k - <u>Cached</u> - <u>Similar pages</u>
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<u>Network Systems DesignLine | Solve distortion, echo return, and ...</u>
Solve distortion, echo return, and **vibration** in plastic hands-free designs--Part II ...
There is also a **resonance frequency** at approximately 420Hz, ...
www.networksystemsdesignline.com/howto/196601113 - 38k -
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<u>**Speaker** system</u>
In this **speaker** system, the **resonance frequency** is determined by the interior ...
Wireless speaker systems provide a particularly attractive solution since ...
www.electronics-manufacturers.com/info/audio-electronics/**speaker**-system.html -
33k - <u>Cached</u> - <u>Similar pages</u>

<u>Deer Repellent/ Seismic Sensors</u>
The seismic sensor is built from an ordinary 2 inch **speaker** by gluing a mass to the
speaker cone to lower its **resonance frequency**. ...
www.techlib.com/electronics/seismic.htm - 11k - <u>Cached</u> - <u>Similar pages</u>

<u>Sound/vibration resonance separating device - US Patent 7116035</u>
A piano wire is fixed on the rigid body and then the **speaker** of this equipment emits
vibration and a **resonance frequency** is recorded. ...
www.patentstorm.us/patents/7116035-description.html - 24k -
<u>Cached</u> - <u>Similar pages</u>

<u>Pringles Yagi Antenna</u>
Cantenna " - yagi design for 802.11b **wireless** application ... They warn that 2.4 GHz
just happens to also be the **resonant frequency** of plain old water. ...
www.netscum.com/~clapp/**wireless**.html - 35k - <u>Cached</u> - <u>Similar pages</u>

<u>**Speaker** and **speaker** device</u>
In the **speaker** device 100, the back-and-forth **vibration** of the vibrator of ...
Furthermore, the **resonant frequency** of the **speaker** of the **speaker** device is ...
www.patentopedia.us/memory_communication_line_control/**speaker_speaker**.html -
57k - <u>Cached</u> - <u>Similar pages</u>

<u>Audio DesignLine | Solve distortion, echo return, and **vibration** in ...</u>
This should be placed between both the plastic enclosure and **speaker** as well as the
speaker ... There is also a **resonance frequency** at approximately 420Hz, ...
www.audiodesignline.com/howto/196602173 - 37k - <u>Cached</u> - <u>Similar pages</u>

<u>Tales From The Tone Lounge: **Speakers**</u>
At this **resonant frequency**, the **speaker** is most efficient at converting ... with a
minimum of sound coloration or enclosure **vibration** and **resonance**. ...
tone-lizard.com/**Speakers**.htm - 24k - <u>Cached</u> - <u>Similar pages</u>

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Web   Results **11 - 20** of about **114,000** for <u>wireless</u> and <u>resonant</u> <u>frequency</u> and <u>speaker</u> <u>vibrate</u>. (0.17 seconds)

<u>Piezoelectric Dome Delivers Better **Speaker** Sound</u>
Dynamic drivers operate above their **resonant frequency**, which is not ideal ... Build
Ethernet or 802.11 b/g **wireless** networking into your products so they ...
www.elecdesign.com/Articles/ArticleID/13398/13398.html - <u>Similar pages</u>

<u>Circuit for automatically driving mechanical device at its ...</u>
During their operation, these alarm systems are preferably operated at or near the
resonance frequency of the **vibrating** element even though such alarm ...
www.patentstorm.us/patents/6339368-description.html - 45k -
<u>Cached</u> - <u>Similar pages</u>

<u>**Resonant Frequency** « Electromagnetic Frequencies</u>
"Hands-free" mobile **speaker**-phones cause even more crashes because they
typically ... representing corresponding points of a wave that **vibrate** in unison. ...
cellphonesafety.wordpress.com/tag/**resonant-frequency**/ - 261k -
<u>Cached</u> - <u>Similar pages</u>

<u>**Speakers** Glossary</u>
The tendency of an object to **vibrate** most at a particular **frequency**. Resonance
Frequency The particular **frequency** at which a **speaker** tends to **vibrate** the ...
www.creative.com/products/**speakers**/tech/welcome.asp?id=67892&I=R - 35k -
<u>Cached</u> - <u>Similar pages</u>

<u>Car Audio Advice | Stereo Terminology And Education</u>
The tendency for a mechanical or electrical systems to **vibrate** or resonate ...
Resonant Frequency The **frequency** at which a **speaker** cone vibrates with the ...
www.electronixwarehouse.com/education/glossary/R.htm - 53k -
<u>Cached</u> - <u>Similar pages</u>

<u>Fiber Bragg grating microphone system—[Applied Physics Letters 89 ...</u>
The coupling of the acoustic **vibration** is higher at the **resonance frequency** of the
tube length. In the case of this sensor, the tube length of resulted in a ...
link.aip.org/link/?APPLAB/89/161109/1 - <u>Similar pages</u>

<u>PA **Speakers**: Glossary</u>
Resonance is the tendency of a mechanical or electrical system to **vibrate** or
oscillate at a certain **frequency** when excited by an external source, ...
www.sweetwater.com/shop/live-sound/pa-**speakers**/glossary.php - 188k -
<u>Cached</u> - <u>Similar pages</u>

<u>On Headphones Audiophile Glossary - Headphone terminology defined ...</u>
Tuning **Frequency**, The Helmholtz **resonant frequency** of a box. ... to the **speaker**
cone and causes the cone to **vibrate** inresponse to the audio current in the ...
www.onheadphones.com/glossary/?begin=175 - 16k - <u>Cached</u> - <u>Similar pages</u>

[DOC] <u>PETER P</u>
File Format: Microsoft Word - <u>View as HTML</u>
Radio **frequency** reference device vibrated from **speaker** sound and modulated RF
signal, thus causing distortion. Solution: Investigated **vibration** spectrum. ...
www.audioscientific.com/Audio_Scientific_%20Accomplishments_12_05.doc -
<u>Similar pages</u>

<u>Sound</u>
To put it simply a **speaker** will perform better if the sound waves emerging ... All
materials have a **resonant frequency** at which they **vibrate** when sound of ...
www.geocities.com/OzDCC/soundsem.htm - 21k - <u>Cached</u> - <u>Similar pages</u>

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1 Applications: Spatialized audio rendering for immersive virtual environments   ▬
Martin Naef, Oliver Staadt, Markus Gross
November 2002 **Proceedings of the ACM symposium on Virtual reality software and technology VRST '02**
Publisher: ACM Press
Full text available: 📄 pdf(917.70 KB)   Additional Information: full citation, abstract, references, citings, index terms

We present a spatialized audio rendering system for the use in immersive virtual environments. The system is optimized for rendering a sufficient number of dynamically moving sound sources in multi-speaker environments using off-the-shelf audio hardware. Based on simplified physics-based models, we achieve a good trade-off between audio quality, spatial precision, and performance. Convincing acoustic room simulation is accomplished by integrating standard hardware reverberation devices as used i ...

Keywords: 3D audio, spatially immersive display, virtual reality

2 Level set and PDE methods for computer graphics   ▬
David Breen, Ron Fedkiw, Ken Museth, Stanley Osher, Guillermo Sapiro, Ross Whitaker
August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**
Publisher: ACM Press
Full text available: 📄 pdf(17.07 MB)   Additional Information: full citation, abstract, citings

Level set methods, an important class of partial differential equation (PDE) methods, define dynamic surfaces implicitly as the level set (iso-surface) of a sampled, evolving nD function. The course begins with preparatory material that introduces the concept of using partial differential equations to solve problems in computer graphics, geometric modeling and computer vision. This will include the structure and behavior of several different types of differential equations, e.g. the level set eq ...

3 Automatic babble recognition for early detection of speech related disorders   ▬
Harriet J. Fell, Joel MacAuslan, Karen Chenausky, Linda J. Ferrier
January 1998 **Proceedings of the third international ACM conference on Assistive technologies Assets '98**
Publisher: ACM Press
Full text available: 📄 txt(29.17 KB)   Additional Information: full citation, references, citings, index terms

Keywords: acoustic analysis, early intervention, infants, pre-speech vocalization

4 IPSN/SPOTS posters: Health monitoring of civil infrastructures using wireless sensor networks   ☐
Sukun Kim, Shamim Pakzad, David Culler, James Demmel, Gregory Fenves, Steven Glaser, Martin Turon
April 2007   **Proceedings of the 6th international conference on Information processing**

in sensor networks IPSN '07

Publisher: ACM Press

Full text available: pdf(1.01 MB)   Additional Information: full citation, abstract, references, index terms

A Wireless Sensor Network (WSN) for Structural Health Monitoring (SHM) is designed, implemented, deployed and tested on the 4200ft long main span and the south tower of the Golden Gate Bridge (GGB). Ambient structural vibrations are reliably measured at a low cost and without interfering with the operation of the bridge. Requirements that SHM imposes on WSN are identified and new solutions to meet these requirements are proposed and implemented. In the GGB deployment, 64 nodes are distributed ...

Keywords: deployment, large-scale, structural health monitoring, wireless sensor networks

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5   Embedded technologies: High damping electrostatic system for vibration energy scavenging

G. Despesse, J. J. Chaillout, T. Jager, J. M. Léger, A. Vassilev, S. Basrour, B. Charlot

October 2005 **Proceedings of the 2005 joint conference on Smart objects and ambient intelligence: innovative context-aware services: usages and technologies sOc-EUSAI '05**

Publisher: ACM Press

Full text available: pdf(148.36 KB)   Additional Information: full citation, abstract, references

Advances in low power electronics and microsystems design open up the possibility to power small wireless sensor nodes thanks to energy scavenging techniques. Among the potential energy sources, we have focused on mechanical surrounding vibrations. To convert vibrations into electrical power we have chosen mechanical structures based on electrostatic transduction. Thanks to measurements and in agreement with recent studies [1], we have observed that most of surrounding mechanical vibrations occu ...

---

6   IPSN/SPOTS posters: Active sensing platform for wireless structural health monitoring

D. Musiani, K. Lin, T. Simunic Rosing

April 2007 **Proceedings of the 6th international conference on Information processing in sensor networks IPSN '07**

Publisher: ACM Press

Full text available: pdf(1.72 MB)   Additional Information: full citation, abstract, references, index terms

This paper presents SHiMmer, a wireless platform for sensing and actuation that combines localized processing with energy harvesting to provide long-lived structural health monitoring. The life-cycle of the node is significantly extended by the use of super-capacitors for energy storage instead of batteries. During this period the node is expected to work completely maintenance-free. The node is capable of harvesting up to 780J per day. This makes it completely self-sufficient while employed ...

Keywords: actuation, energy harvesting, low power, sensing, wireless

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7   Work-in-progress: Supporting children's rhythm learning using vibration devices

Sosuke Miura, Masanori Sugimoto

April 2006 **CHI '06 extended abstracts on Human factors in computing systems CHI '06**

Publisher: ACM Press

Full text available: pdf(884.92 KB)   Additional Information: full citation, abstract, references, index terms

In this paper, a rhythm instruction tool for school children using vibration devices is discussed. The proposed system called T-RHYTHM is for supporting individual children in playing musical instruments or singing, in solo or ensemble situations. T-RHYTHM provides each child with rhythm patterns of musical pieces through tactile senses, and supports her so that she can recognize her own rhythm without being confused by other children's performances or singing voices. The rhythm of the music giv ...

Keywords: children, rhythm learning, vibration device

---

8   Energy-efficient platform designs for real-world wireless sensing applications

P. H. Chou, Chulsung Park

May 2005 **Proceedings of the 2005 IEEE/ACM International conference on Computer-**

aided design ICCAD '05

Full text available: pdf(439.17 KB)   Additional Information: full citation, abstract

Real-world wireless sensing applications demand system platforms with a wide range of size, cost, power consumption, connectivity, performance, and flexibility requirements. These goals cannot be achieved without understanding the nature of the sensing functions in the first place, which can be classified into passive vs. active sensing, event detection vs. data acquisition, and real-time monitoring vs. data logging. This paper discusses platform design techniques for supporting these design goa ...

9   Section 06: objects in space: ComTouch: design of a vibrotactile communication device

Angela Chang, Sile O'Modhrain, Rob Jacob, Eric Gunther, Hiroshi Ishii

June 2002   **Proceedings of the conference on Designing interactive systems: processes, practices, methods, and techniques DIS '02**

Full text available: pdf(4.16 MB)   Additional Information: full citation, abstract, references, citings, index terms

We describe the design of ComTouch, a device that augments remote voice communication with touch, by converting hand pressure into vibrational intensity between users in real-time. The goal of this work is to enrich inter-personal communication by complementing voice with a tactile channel. We present preliminary user studies performed on 24 people to observe possible uses of the tactile channel when used in conjunction with audio. By recording and examining both audio and tactile data, we found ...

Keywords: communication, haptic interpersonal, remote communication, tactile communication, tangible telepresence, tangible user interface, touch-vibration mapping, vibrotactile

10 Unconventional human computer interfaces

Steffi Beckhaus, Ernst Kruijff

August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Full text available: pdf(2.89 MB)   Additional Information: full citation, abstract

This course focuses on how we can use the potential of the human body in experimental or unconventional interface techniques. It explores the biological or physiological characteristics of the separate parts of the body, from head to toe, and from skin to heart, showing how their sensor (input) and control (output) capabilities can be applied to human computer interfaces. We demonstrate a wide variety of applications that make use proven interfaces as well as extremely experimental systems. Exam ...

11 Vibration-to-electric energy conversion

Scott Meninger, Jose Oscar Mur-Miranda, Rajeevan Amirtharajah, Anantha Chandrakasan, Jeffrey Lang

August 1999 **Proceedings of the 1999 international symposium on Low power electronics and design ISLPED '99**

Full text available: pdf(952.15 KB)   Additional Information: full citation, references, citings, index terms

Keywords: MEMS, energy conversion, low-power, self-powered

12 Low power systems for wireless microsensors

K. Bult, A. Burstein, D. Chang, M. Dong, M. Fielding, E. Kruglick, J. Ho, F. Lin, T. Lin, W. Kaiser, H. Marcy, R. Mukai, P. Nelson, F. Newburg, K. Pister, G. Pottie, H. Sanchez, O. Stafsudd, K. Tan, S. Xue, J. Yao

August 1996 **Proceedings of the 1996 international symposium on Low power electronics and design ISLPED '96**

Full text available: pdf(1.08 MB)   Additional Information: full citation, references, citings, index terms

13 R2-D: general symposium: Emerging short reach wireless technologies: from 802.11n
to 60+ GHz mm-Wave Radios—a silicon perspective
Sheehan Khan, Kris Iniewski, Yanjie Wang, Christian Schlegel, Win Myint
July 2006   **Proceeding of the 2006 international conference on Communications and
mobile computing IWCMC '06**
Publisher: ACM Press
Full text available: pdf(324.97 KB)   Additional Information: full citation, abstract, references, index terms

The paper presents an overview survey of emerging wireless technologies suitable for
short reach (<100m) RF communication starting from the existing high bit-rate systems
(802.11n, 802.15.3a) and ending with 60 GHz mm-wave radios. Basic principles, power
dissipation levels and hardware realization challenges in silicon are discussed. Prospects of
building technologies that achieve Gigabit per second data rates are investigated.

Keywords: 60 GHz radios, 802.11n, ultra-wideband (UWB)

14 Multimedia for tiny devices: Position calibration of audio sensors and actuators in a
distributed computing platform
Vikas C. Raykar, Igor Kozintsev, Rainer Lienhart
November 2003 **Proceedings of the eleventh ACM international conference on Multimedia
MULTIMEDIA '03**
Publisher: ACM Press
Full text available: pdf(593.03 KB)   Additional Information: full citation, abstract, references, citings, index terms

In this paper, we present a novel approach to automatically determine the positions of
sensors and actuators in an ad-hoc distributed network of general purpose computing
platforms. The formulation and solution accounts for the limited precision in temporal
synchronization among multiple platforms. The theoretical performance limit for the
sensor positions is derived via the Cramer-Rao bound. We analyze the sensitivity of
localization accuracy with respect to the number of sensors and actuators ...

Keywords: Cramer-Rao bound, microphone array calibration, multidimensional scaling,
position calibration, self-localization, sensor networks

15 Low-power micromachined microsystems (invited talk)
Khalil Najafi
August 2000 **Proceedings of the 2000 international symposium on Low power
electronics and design ISLPED '00**
Publisher: ACM Press
Full text available: pdf(1.40 MB)   Additional Information: full citation, abstract, references, index terms

Micromachined microsystems and Micro Electro Mechanical Systems (MEMS) have made
possible the development of highly accurate and portable sensors and instrument for a
variety of applications in the health care, industrial, consumer products, avionics, and
defense. Design of low-power circuits for these applications, and use of micromachined
sensors and actuators in combination with integrated circuits to implement even lower
power microinstruments has now become possible and the focus of at ...

Keywords: MEMS, energy harvesting, low-power, micromachining, microsystems, power
sources

16 Hardware platforms: A platform for ubiquitous sensor deployment in occupational and
domestic environments
Joshua Lifton, Mark Feldmeier, Yasuhiro Ono, Cameron Lewis, Joseph A. Paradiso
April 2007   **Proceedings of the 6th international conference on Information processing
in sensor networks IPSN '07**
Publisher: ACM Press
Full text available: pdf(5.53 MB)   Additional Information: full citation, abstract, references, index terms

In this paper, we introduce the "Plug" sensor network, a ubiquitous networked sensing
platform ideally suited to broad deployment in environments where people work and live.
The backbone of the Plug sensor network is a set of 35 sensor-, radio-, and computation-
enabled power strips distributed throughout the third oor of the MIT Media Lab. A single
Plug device fulfills all the functional requirements of a normal power strip (i.e., four 120V,

60Hz electrical outlets; surge protector circuit; s ...

17 Pen computing: a technology overview and a vision

André Meyer

July 1995   **ACM SIGCHI Bulletin**, Volume 27 Issue 3

Publisher: ACM Press

Full text available: pdf(5.14 MB)   Additional Information: full citation, abstract, citings, index terms

> This work gives an overview of a new technology that is attracting growing interest in public as well as in the computer industry itself. The visible difference from other technologies is in the use of a pen or pencil as the primary means of interaction between a user and a machine, picking up the familiar pen and paper interface metaphor. From this follows a set of consequences that will be analyzed and put into context with other emerging technologies and visions.Starting with a short historic ...

18 SPOTS track: Experiences and directions in pushpin computing

Joshua Lifton, Michael Broxton, Joseph A. Paradiso

April 2005   **Proceedings of the 4th international symposium on Information processing in sensor networks IPSN '05**

Publisher: IEEE Press

Full text available: pdf(496.79 KB)   Additional Information: full citation, abstract, references

> Over the last three years we have built and experimented with the Pushpin Computing wireless sensor network platform. The Pushpin platform is a tabletop multihop wireless sensor network testbed comprised of 100 nodes arbitrarily placed within a one-square-meter area. The Pushpin platform's concise form factor and extreme node density allow for fine-grained control of its environment and immediate user interaction, thereby uniquely situating it between simulated and real world sensor networks. Th ...

19 Late breaking results: short papers: Audio-haptic feedback in mobile phones

Angela Chang, Conor O'Sullivan

April 2005   **CHI '05 extended abstracts on Human factors in computing systems CHI '05**

Publisher: ACM Press

Full text available: pdf(445.51 KB)   Additional Information: full citation, abstract, references, citings, index terms

> A new breed of mobile phones has been designed to enable concurrent vibration and audio stimulation, or *audio-haptics*. This paper aims to share techniques for creating and optimizing audio-haptic effects to enhance the user interface.The authors present audio manipulation techniques specific to the multifunction transducer (MFT) technology. In particular two techniques, the Haptic Inheritance and Synthesis and Matching methods are discussed. These two methods of haptic media generation al ...

> **Keywords:** MFTs, audio, audio-haptics, design research, haptic inheritance, haptics, sensorialism, synthesis and matching

20 Embedded tutorial 4: Design and power management of energy harvesting embedded systems

Vijay Raghunathan, Pai H. Chou

October 2006 **Proceedings of the 2006 international symposium on Low power electronics and design ISLPED '06**

Publisher: ACM Press

Full text available: pdf(78.84 KB)   Additional Information: full citation, abstract, references, index terms
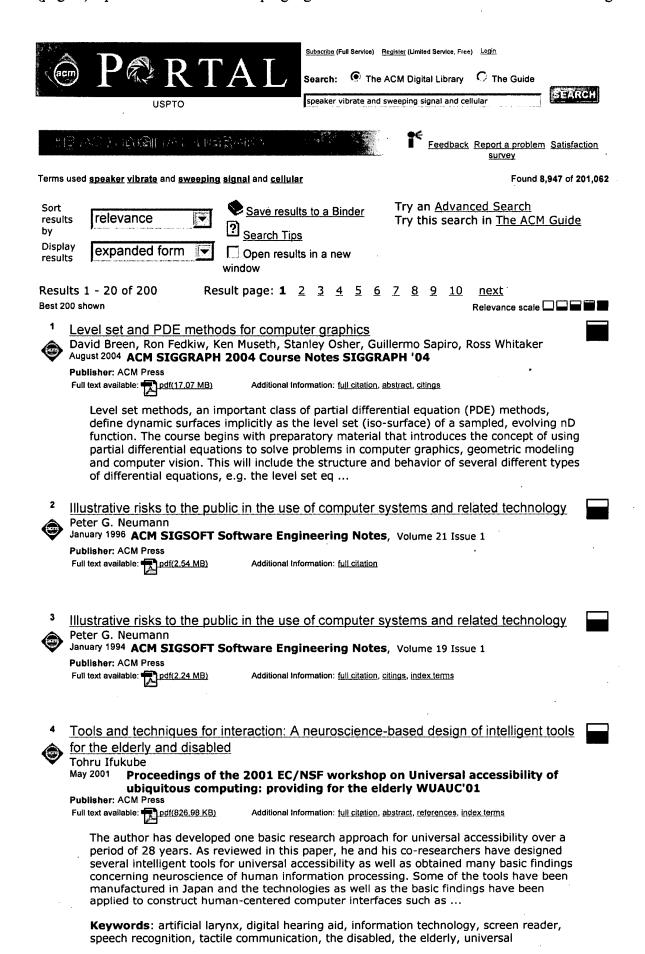
> Harvesting energy from the environment is a desirable and increasingly important capability in several emerging applications of embedded systems such as sensor networks, biomedical implants, *etc*. While energy harvesting has the potential to enable near-perpetual system operation, designing an efficient energy harvesting system that actually realizes this potential requires an in-depth understanding of several complex tradeoffs. These tradeoffs arise due to the interaction of numerous fact ...
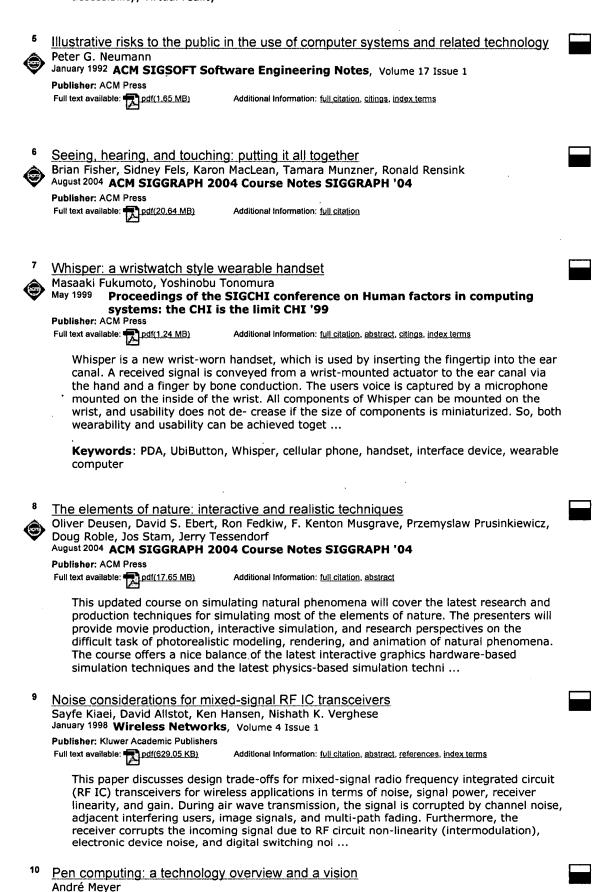
> **Keywords:** energy harvesting, power management, solar power, wireless sensors

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1 **Level set and PDE methods for computer graphics**
David Breen, Ron Fedkiw, Ken Museth, Stanley Osher, Guillermo Sapiro, Ross Whitaker
August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**
Publisher: ACM Press
Full text available: 📄 pdf(17.07 MB)   Additional Information: full citation, abstract, citings

> Level set methods, an important class of partial differential equation (PDE) methods, define dynamic surfaces implicitly as the level set (iso-surface) of a sampled, evolving nD function. The course begins with preparatory material that introduces the concept of using partial differential equations to solve problems in computer graphics, geometric modeling and computer vision. This will include the structure and behavior of several different types of differential equations, e.g. the level set eq ...

2 **Illustrative risks to the public in the use of computer systems and related technology**
Peter G. Neumann
January 1996 **ACM SIGSOFT Software Engineering Notes**, Volume 21 Issue 1
Publisher: ACM Press
Full text available: 📄 pdf(2.54 MB)   Additional Information: full citation

3 **Illustrative risks to the public in the use of computer systems and related technology**
Peter G. Neumann
January 1994 **ACM SIGSOFT Software Engineering Notes**, Volume 19 Issue 1
Publisher: ACM Press
Full text available: 📄 pdf(2.24 MB)   Additional Information: full citation, citings, index terms

4 **Tools and techniques for interaction: A neuroscience-based design of intelligent tools for the elderly and disabled**
Tohru Ifukube
May 2001   **Proceedings of the 2001 EC/NSF workshop on Universal accessibility of ubiquitous computing: providing for the elderly WUAUC'01**
Publisher: ACM Press
Full text available: 📄 pdf(826.98 KB)   Additional Information: full citation, abstract, references, index terms

> The author has developed one basic research approach for universal accessibility over a period of 28 years. As reviewed in this paper, he and his co-researchers have designed several intelligent tools for universal accessibility as well as obtained many basic findings concerning neuroscience of human information processing. Some of the tools have been manufactured in Japan and the technologies as well as the basic findings have been applied to construct human-centered computer interfaces such as ...

> **Keywords:** artificial larynx, digital hearing aid, information technology, screen reader, speech recognition, tactile communication, the disabled, the elderly, universal

accessibility, virtual reality

5 Illustrative risks to the public in the use of computer systems and related technology

Peter G. Neumann

January 1992 **ACM SIGSOFT Software Engineering Notes**, Volume 17 Issue 1

Publisher: ACM Press

Full text available: pdf(1.65 MB)   Additional Information: full citation, citings, index terms

6 Seeing, hearing, and touching: putting it all together

Brian Fisher, Sidney Fels, Karon MacLean, Tamara Munzner, Ronald Rensink

August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Publisher: ACM Press

Full text available: pdf(20.64 MB)   Additional Information: full citation

7 Whisper: a wristwatch style wearable handset

Masaaki Fukumoto, Yoshinobu Tonomura

May 1999   **Proceedings of the SIGCHI conference on Human factors in computing systems: the CHI is the limit CHI '99**

Publisher: ACM Press

Full text available: pdf(1.24 MB)   Additional Information: full citation, abstract, citings, index terms

Whisper is a new wrist-worn handset, which is used by inserting the fingertip into the ear canal. A received signal is conveyed from a wrist-mounted actuator to the ear canal via the hand and a finger by bone conduction. The users voice is captured by a microphone mounted on the inside of the wrist. All components of Whisper can be mounted on the wrist, and usability does not de- crease if the size of components is miniaturized. So, both wearability and usability can be achieved toget ...

Keywords: PDA, UbiButton, Whisper, cellular phone, handset, interface device, wearable computer

8 The elements of nature: interactive and realistic techniques

Oliver Deusen, David S. Ebert, Ron Fedkiw, F. Kenton Musgrave, Przemyslaw Prusinkiewicz, Doug Roble, Jos Stam, Jerry Tessendorf

August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Publisher: ACM Press

Full text available: pdf(17.65 MB)   Additional Information: full citation, abstract

This updated course on simulating natural phenomena will cover the latest research and production techniques for simulating most of the elements of nature. The presenters will provide movie production, interactive simulation, and research perspectives on the difficult task of photorealistic modeling, rendering, and animation of natural phenomena. The course offers a nice balance of the latest interactive graphics hardware-based simulation techniques and the latest physics-based simulation techni ...

9 Noise considerations for mixed-signal RF IC transceivers

Sayfe Kiaei, David Allstot, Ken Hansen, Nishath K. Verghese

January 1998 **Wireless Networks**, Volume 4 Issue 1

Publisher: Kluwer Academic Publishers

Full text available: pdf(629.05 KB)   Additional Information: full citation, abstract, references, index terms

This paper discusses design trade-offs for mixed-signal radio frequency integrated circuit (RF IC) transceivers for wireless applications in terms of noise, signal power, receiver linearity, and gain. During air wave transmission, the signal is corrupted by channel noise, adjacent interfering users, image signals, and multi-path fading. Furthermore, the receiver corrupts the incoming signal due to RF circuit non-linearity (intermodulation), electronic device noise, and digital switching noi ...

10 Pen computing: a technology overview and a vision

André Meyer

July 1995   **ACM SIGCHI Bulletin**, Volume 27 Issue 3
Publisher: ACM Press
Full text available: pdf(5.14 MB)   Additional Information: full citation, abstract, citings, index terms

This work gives an overview of a new technology that is attracting growing interest in public as well as in the computer industry itself. The visible difference from other technologies is in the use of a pen or pencil as the primary means of interaction between a user and a machine, picking up the familiar pen and paper interface metaphor. From this follows a set of consequences that will be analyzed and put into context with other emerging technologies and visions.Starting with a short historic ...

11 Interaction in the real world: Ambient touch: designing tactile interfaces for handheld devices
Ivan Poupyrev, Shigeaki Maruyama, Jun Rekimoto
October 2002 **Proceedings of the 15th annual ACM symposium on User interface software and technology UIST '02**
Publisher: ACM Press
Full text available: pdf(3.71 MB)   Additional Information: full citation, abstract, references, citings, index terms

This paper investigates the sense of touch as a channel for communicating with miniature handheld devices. We embedded a PDA with a TouchEngine™ --- a thin, miniature lower-power tactile actuator that we have designed specifically to use in mobile interfaces (Figure 1). Unlike previous tactile actuators, the TouchEngine is a universal tactile display that can produce a wide variety of tactile feelings from simple clicks to complex vibrotactile patterns. Using the TouchEngine, we bega ...

Keywords: mobile devices and interfaces, tactile feedback

12 Oral II: New pen device for biometrical 3D pressure analysis of handwritten characters, words and signatures
Christian Hook, Juergen Kempf, Georg Scharfenberg
November 2003 **Proceedings of the 2003 ACM SIGMM workshop on Biometrics methods and applications WBMA '03**
Publisher: ACM Press
Full text available: pdf(593.61 KB)   Additional Information: full citation, abstract, references, index terms

The demand for biometric applications in security, human computer interaction and related areas is rapidly increasing. This paper presents an unique biometrical smart pen BiSP for personal identification and handwriting recognition that has been developed in our laboratory. The system is superior to many other biometric techniques which have considerable disadvantages in practice. Several ballpoint like prototypes based on integrated sensors have been designed and constructed. In this report we ...

Keywords: acoustic handwriting recognition, biometric identification, microphone pen, multimodal biometrics, pen-pressure analysis, signature verification

13 Applications: Spatialized audio rendering for immersive virtual environments
Martin Naef, Oliver Staadt, Markus Gross
November 2002 **Proceedings of the ACM symposium on Virtual reality software and technology VRST '02**
Publisher: ACM Press
Full text available: pdf(917.70 KB)   Additional Information: full citation, abstract, references, citings, index terms

We present a spatialized audio rendering system for the use in immersive virtual environments. The system is optimized for rendering a sufficient number of dynamically moving sound sources in multi-speaker environments using off-the-shelf audio hardware. Based on simplified physics-based models, we achieve a good trade-off between audio quality, spatial precision, and performance. Convincing acoustic room simulation is accomplished by integrating standard hardware reverberation devices as used i ...

Keywords: 3D audio, spatially immersive display, virtual reality

14
Social weight: designing to minimise the social consequences arising from technology use by the mobile professional

Aaron Toney, Barrie Mulley, Bruce H. Thomas, Wayne Piekarski
October 2003 **Personal and Ubiquitous Computing**, Volume 7 Issue 5
Publisher: Springer-Verlag
Full text available: ▣ pdf(431.74 KB)   Additional Information: full citation, abstract, citings, index terms

This paper defines the concept of social weight as a design consideration and presents the e-SUIT, a social weight research platform incorporated covertly within a traditional business suit. The e-SUIT allows its user to strike a balance between a given technology's derived benefit and its social consequence. As the e-SUIT is designed for research within a business context, it is built upon commercially available enterprise software. This work is a first step towards subjecting the empirical soc ...

Keywords: Mobile professional, Social weight, Wearable

15 GPGPU: general purpose computation on graphics hardware
David Luebke, Mark Harris, Jens Krüger, Tim Purcell, Naga Govindaraju, Ian Buck, Cliff Woolley, Aaron Lefohn
August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**
Publisher: ACM Press
Full text available: ▣ pdf(63.03 MB)   Additional Information: full citation, abstract, citings

The graphics processor (GPU) on today's commodity video cards has evolved into an extremely powerful and flexible processor. The latest graphics architectures provide tremendous memory bandwidth and computational horsepower, with fully programmable vertex and pixel processing units that support vector operations up to full IEEE floating point precision. High level languages have emerged for graphics hardware, making this computational power accessible. Architecturally, GPUs are highly parallel s ...

16 A mobile pet wearable computer and mixed reality system for human–poultry interaction through the internet
Ping Lee, David Cheok, Soon James, Lyn Debra, Wen Jie, Wang Chuang, Farzam Farbiz
July 2006   **Personal and Ubiquitous Computing**, Volume 10 Issue 5
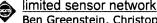**Publisher:** Springer-Verlag
Full text available: ▣ pdf(809.99 KB)   Additional Information: full citation, abstract

Poultry are one of the most badly treated animals in the modern world. It has been shown that they have high levels of both cognition and feelings and as a result there has been a recent trend of promoting poultry welfare. There is also a tradition of keeping poultry as pets in some parts of the world. However, in modern cities and societies, it is often difficult to maintain contact with pets, particularly for office workers. We propose and describe a novel cybernetics system to use mobile and ...

Keywords: Cybernetics, Haptic interfaces, Mixed reality, Mobile computing, Multimodal interaction, Wearable devices

17 In-network processing: Capturing high-frequency phenomena using a bandwidth-limited sensor network
Ben Greenstein, Christopher Mar, Alex Pesterev, Shahin Farshchi, Eddie Kohler, Jack Judy, Deborah Estrin
October 2006 **Proceedings of the 4th international conference on Embedded networked sensor systems SenSys '06**
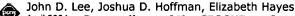**Publisher:** ACM Press
Full text available: ▣ pdf(853.96 KB)   Additional Information: full citation, abstract, references, index terms

Small-form-factor, low-power wireless sensors-motes-are convenient to deploy, but lack the bandwidth to capture and transmit raw high-frequency data, such as human voices or neural signals, in real time. Local filtering can help, but we show that the right filter settings depend on changing ambient conditions and network effects such as congestion, which makes them dynamic and unpredictable. Mote collection systems for high-frequency data must support iteratively-tuned, deployment-specific filte ...

Keywords: acoustics, health monitoring, motes, sensor networks, signal processing frameworks

18 Collision warning design to mitigate driver distraction
John D. Lee, Joshua D. Hoffman, Elizabeth Hayes
April 2004   **Proceedings of the SIGCHI conference on Human factors in computing systems CHI '04**
Publisher: ACM Press
Full text available: pdf(299.61 KB)   Additional Information: full citation, abstract, references, citings, index terms

As computers and other information technology move into cars and trucks, distraction-related crashes are likely to become an important problem. This paper begins to address this problem by examining how alert strategy (graded and single-stage) and alert modality (haptic and auditory) affect how well collision warning systems mitigate distraction and direct drivers attention to the car ahead when it unexpectedly brakes. We conducted two experiments in which drivers interacted with an in-vehicle e ...

Keywords: collision warning systems, distraction, notification systems, smart cars, trust, user acceptance

19 Interactive posters: mobility: Active click: tactile feedback for touch panels
Masaaki Fukumoto, Toshiaki Sugimura
March 2001   **CHI '01 extended abstracts on Human factors in computing systems CHI '01**
Publisher: ACM Press
Full text available: pdf(149.94 KB)   Additional Information: full citation, abstract, references, citings, index terms

"Active Click" is a new interface mechanism for addling tactile feedback to touch panels. A small actuator is attached to a body of PDA or the backside of a touch panel. The tactile feedback, created by driving the actuator with a short pulse, is perceived by the grasping hand or tapping finger-tip when the panel is tapped. Active Click is effective in improving the input speed of touch panel operation especially in noisy situations. Active click is also useful for large touch panel devices such ...

Keywords: PDA, click, interface device, touch panel

20 IC Design Challenges for Ambient Intelligence
Emile Aarts, Raf Roovers
March 2003   **Proceedings of the conference on Design, Automation and Test in Europe - Volume 1 DATE '03**
Publisher: IEEE Computer Society
Full text available:
pdf(232.44 KB)   Additional Information: full citation, abstract, citings, index terms
Publisher Site

The vision of Ambient Intelligence opens a world of unprecedente experiences: the interaction of people with electronic devices is changed as contextual awareness, natural interfaces and ubiquitous availability of information are realized. We analyze the consequences of the ambient intelligence vision for electronic devices by mapping the involved technologies on a power-information graph. Based on the differences in power consumption, three types of devices are introduce: the autonomous or micr ...

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